

ENGLISH

Digital Video Camcorder

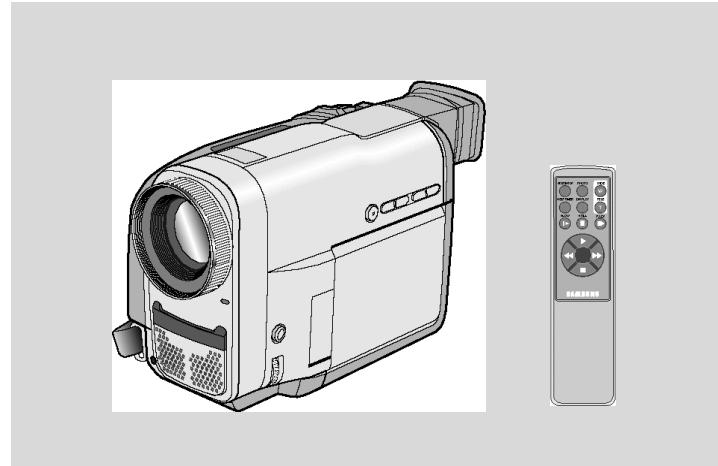
Mini **DV** Digital
Video
Cassette **SCD55/D60**

AF Auto Focus
CCD Charge Coupled Device
LCD Liquid Crystal Display

Owner's Instruction Book

Before operating the unit, please read this instruction book thoroughly, and retain it for future reference.

US PATENT 4415844



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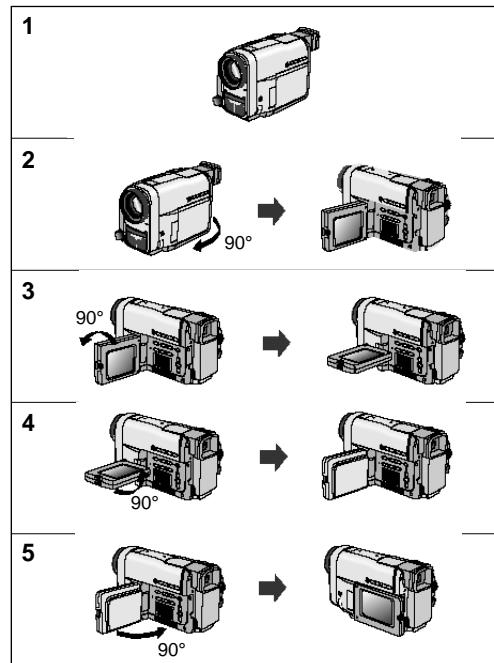
Warranty 70

Notices and Safety Instructions

Notices regarding rotation of LCD screen

Please rotate the LCD screen carefully as illustrated. Unintended rotation may cause damage to the inside of the hinge that connects the LCD screen to the Camcorder.

1. LCD screen closed.
2. Standard recording by using the LCD screen.
3. Making a recording by looking at the LCD screen from the top.
4. Making a recording by looking at the LCD screen from the front.
5. Making a recording with the LCD screen closed.



Notices and Safety Instructions

Notices regarding COPYRIGHT

Television programs, video tapes, DVD titles, films, and other program materials may be copyrighted.
Unauthorized copying of copyrighted material may be against the law.

Notices regarding moisture condensation

1. A sudden rise in atmospheric temperature may cause condensation to form inside the camcorder.

for example:

- When you move the camcorder from cold outside to warm inside during the winter.
 - When you move the camcorder from cool inside to hot outside during the summer.
2. If the "DEW" protection feature is activated, leave the camcorder for at least two hours in a dry, warm room with the cassette compartment opened and the battery removed.
 3. If the "DEW" protection feature is activated unexpectedly, and you want to override it, press the RESET button using a sharp-pointed object.
(If you press the RESET button, all the settings including the date and time, return to default.)
Please make sure that the condensation has disappeared completely.

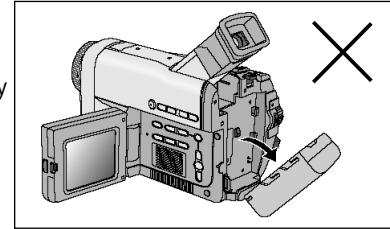
Notices regarding CAMCORDER

1. Do not leave the camcorder exposed to high temperature(above 60°C or 140°F). For example, in a parked car in the sun or under direct sunlight.
2. Do not let the camcorder get wet.
Keep the camcorder away from rain, sea water, and any other form of moisture. If the camcorder gets wet, it may be damaged.
Sometimes malfunction cannot be repaired.

Notices and Safety Instructions

Notices regarding the battery pack

- ⌘ Make sure that the battery pack is charged before recording outdoors.
- ⌘ To preserve battery power, keep your camcorder turned off when you are not operating it.
- ⌘ When your camcorder is in CAMERAmode, if it is left in STBY mode without operation for more than 3 minutes with a tape installed, it will automatically turn off to protect against unnecessary battery discharge.
- ⌘ Make sure that the battery pack is fitted firmly into place.
Dropping the battery pack may damage it.
- ⌘ A brand new battery pack is not charged.
Before using the battery pack, charge it completely.
- ⌘ It is a good idea to use the viewfinder instead of the LCD when recording for a long time, because the LCD uses up more battery power.



* When the battery reaches the end of its life, please contact your local dealer.

The batteries have to be dealt with as chemical waste.

Notices regarding charging the lithium battery in the camcorder

1. This camcorder is supplied with a lithium battery installed.
2. The battery will be completely discharged in about 3 months if the camcorder is not used.
Then all the settings, including the date and time return to default.
 - The lithium battery is always charged as long as you are using the camcorder.
3. To retain the date and time, charge the battery if the battery is discharged.
 - Connect the camcorder to an AC outlet using the supplied AC power adaptor, and leave the camcorder with the POWER switch set to PLAYER for more than 24 hours.

Notices and Safety Instructions

Notice regarding the LENS

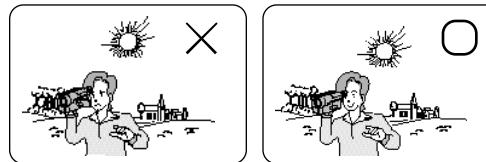
- ⌘ Do not shoot in direct sunlight with the LENS pointing towards the sun.
Direct sunlight can damage the CCD(Charge Coupled Device).

Notices regarding electronic viewfinder

1. Do not place the camcorder so that the viewfinder is pointing towards the sun.
Direct sunlight can damage the inside of the viewfinder.
Be careful when placing the camcorder under sunlight or by a window.
2. Do not pick up the camcorder by the viewfinder.
3. Unintended rotation may cause damage to the viewfinder.

Notices regarding Record or Playback using LCD

1. The LCD monitor is manufactured using high precision technology.
However, there may be some tiny dots(red, blue or green in color)
that appear on the LCD monitor.
These dots are normal and do not affect the recorded picture in any way.
2. When you use the LCD monitor outdoors in direct sunlight, it may be difficult to see.
In this case, we recommend that you use the viewfinder.
3. Direct sunlight can damage the LCD monitor.



Notices regarding the hand strap

- ⌘ It is very important to adjust the hand strap for better recording.
- ⌘ Do not insert your hand in the hand strap forcibly, you may damage the buckle.



Notices and Safety Instructions

Notices regarding video head cleaning

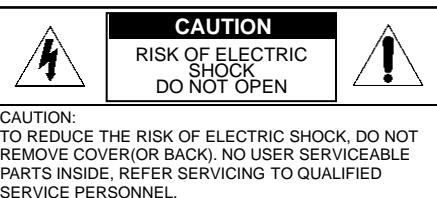
- ⌘ To ensure normal recording and a clear picture, clean the video heads.
If a square block-shaped noise distorts playback pictures, or if only a blue screen is displayed during playback, the video heads may be dirty. If this happens, clean the video heads with a dry type cleaning cassette.
- ⌘ Do not use a wet type cleaning cassette. It may damage the video heads.

Notices regarding vibration of the speaker in playback

- ⌘ Speaker sound is muted when the LCD monitor is turned off.
- ⌘ Turn the speaker volume down if speaker vibration causes an unstable image during playback.

Notices and Safety Instructions

Safety Instructions



To prevent electric shock, match wide blade of plug to wide slot and fully insert.

1. READ INSTRUCTIONS:

All the safety and operating instructions should be read before the CAMCORDER is operated.

2. RETAIN INSTRUCTIONS:

The safety and operating instructions should be retained for future reference.

3. HEED WARNINGS:

All warnings on the CAMCORDER and in the operating instructions should be adhered to.

4. FOLLOW INSTRUCTIONS:

All operating and maintenance instructions should be followed.

5. CLEANING:

Unplug this CAMCORDER from the wall outlet before cleaning.
Do not use liquid or aerosol cleaners.
Use a dry cloth used for dusting cabinets.

6. ATTACHMENTS:

Do not use attachments not recommended by the CAMCORDER product manufacturer as they may be hazardous.



This symbol is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of fire or electric shock.



This symbol is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying this product.

7. WATER AND MOISTURE:

Do not use this CAMCORDER near water; for example, near a bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement, near a swimming pool or lake.

8. ACCESSORIES:

Do not place this CAMCORDER on an unstable cart, stand, tripod, bracket or table. The CAMCORDER may fall, causing serious injury to a child or adult, and serious damage to the unit.
Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the CAMCORDER. Any mounting of the unit should follow the manufacturer's instructions and should use a mounting accessory recommended by the manufacturer.

A. An appliance and cart combination should be moved with care.
Quick stops, excessive force and uneven surfaces may cause the appliance and cart combination to overturn.

PORTABLE CART WARNING
(Symbol provided by RETAC)



Notices and Safety Instructions

9. VENTILATION:

Slots and openings in the cabinet are provided for ventilation to ensure reliable operation of the CAMCORDER and to protect it from overheating. These openings must not be blocked or covered.

Never place your CAMCORDER on a bed, sofa, rug, or other similar surface: on or near a radiator or heat register.

This CAMCORDER should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

10. POWER SOURCES:

The CAMCORDER should be operated only from the type of power source indicated on the label.

If you are not sure of the type of power supply at your home, consult your appliance dealer or local power company.

A CAMCORDER is intended to be operated from battery power, or other sources, refer to the operating instructions.

11. GROUNDING OR POLARIZATION:

This CAMCORDER may be equipped with either a polarized 2-wire AC line plug (a plug having one blade wider than the other) or a 3-wire grounding type plug, a plug having a third (grounding) pin.

If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to replace your outlet. Do not defeat the safety purpose of the polarized plug.

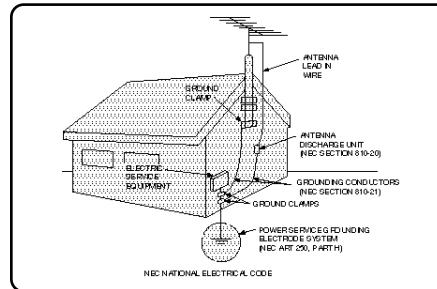
12. POWER-CORD PROTECTION:

Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords or plugs, convenient receptacles, and the point where they exit from the unit.

13. OUTDOOR ANTENNA GROUNDING:

If an outside antenna or cable system is connected to the CAMCORDER, be sure the antenna or cable system is grounded to provide some protection against voltage surges and built-up static charges, Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire and supporting structure, grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes and requirements for the grounding electrode.

See figure below.



Notices and Safety Instructions

14. LIGHTNING:

For added protection of this CAMCORDER during a lightning storm or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system.

This will prevent damage to the CAMCORDER due to lightning and power-line surges.

15. POWER LINES:

An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

16. OVERLOADING:

Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.

17. OBJECTS AND LIQUIDS:

Never push objects of any kind into this CAMCORDER through openings as they may touch dangerous voltage points or short out a part that could result in a fire or electric shock.

Never spill liquids of any kind onto the CAMCORDER. Should spillage occur, unplug unit and have it checked by a technician before use.

18. SERVICING:

Do not attempt to service this CAMCORDER yourself. Opening or removing covers may expose you to dangerous voltage or other hazards.

Refer all servicing to qualified service personnel.

19. DAMAGE REQUIRING SERVICE:

Unplug this CAMCORDER from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- a. When the power-supply cord or plug is damaged.
- b. If any liquid has been spilled onto, or objects have fallen into the CAMCORDER.
- c. If the CAMCORDER has been exposed to rain or water.
- d. If the CAMCORDER does not operate normally by following the operating instructions, adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the CAMCORDER to its normal operation.
- e. If the CAMCORDER has been dropped or the cabinet has been damaged.
- f. When the CAMCORDER exhibits a distinct change in performance, this indicates a need for service.

20. REPLACEMENT PARTS:

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer and having the same characteristics as the original part.

Unauthorized substitutions may result in fire, electric shock or other hazards.

21. SAFETY CHECK:

Upon completion of any service or repairs to this CAMCORDER, ask the service technician to perform safety checks to determine that the CAMCORDER is in safe operating order.

Notices and Safety Instructions

NOTE TO CATV SYSTEM INSTALLER:

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

USER INSTALLER CAUTION:

Your authority to operate this FCC certified equipment could be voided if you make changes or modifications not expressly approved by this party responsible for compliance to part 15 FCC rules.

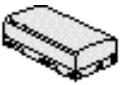
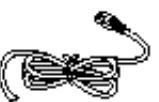
Getting to Know Your Camcorder

Accessories Supplied with your Camcorder

Make sure that the following basic accessories are supplied with your digital video camera.

Basic Accessories

1. Lithium Ion Battery pack
2. AC Power Adaptor
3. AUDIO/VIDEO cable
4. AC cord
5. Remote Control
6. AA batteries for Remote control
7. S-VIDEO cable
8. Instruction Book
9. Shoulder Strap
10. RS-232C cable (SCD60 only)
11. Photoland RS diskette (SCD60 only)

1. Lithium Ion Battery pack	2. AC Power Adaptor	3. AUDIO/VIDEOcable
		
4. AC cord		6. AA batteries for Remote control
		
7.S-VIDEO cable	8. Instruction Book	
		
10. RS-232C cable (SCD60 only)	11. Photoland RS diskette (SCD60 only)	
		

Getting to Know Your Camcorder

Features

- **Digital data transfer function with IEEE1394**

By incorporating the IEEE 1394 (i.LINK™ : i.LINK is a serial data transfer protocol and interconnection system, used to transmit DV data) high speed data transport port, moving and still images can be transferred to your PC, making it possible to produce or edit various images.

- **Digital still image transfer function with RS-232C (SCD60 only)**

You can transfer still images to your PC using the RS-232C connection without any add-on card.

- **PHOTO**

The PHOTO function lets you record an object at a standstill for a limited time in Camera mode.

- **440x Digital zoom**

Zooming is a recording technique that lets you change the size of the subject in the picture.

- **Color TFT LCD**

High resolution color TFT LCD (with 112,320 pixels) gives you clean, sharp images and a comfortable, stable position for shooting.

- **Digital Image Stabilizer**

The DIS compensates for unstable images caused by hand shake, particularly at high magnification.

- **Various digital effects**

The DSE(Digital Special Effects) allows you to give your films a creative look by adding various special effects.

- **Intelligent-Back Light Compensation (SCD60 only) / Back Light Compensation**

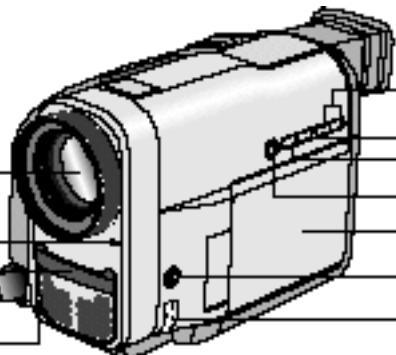
■ When you shoot a subject with a light source or light background behind the subject, use the I-BLC/BLC function.

- **Program AE**

The Program AE enables you to adapt the shutter speed and aperture to the type of scene to be filmed.

Getting to Know Your Camcorder

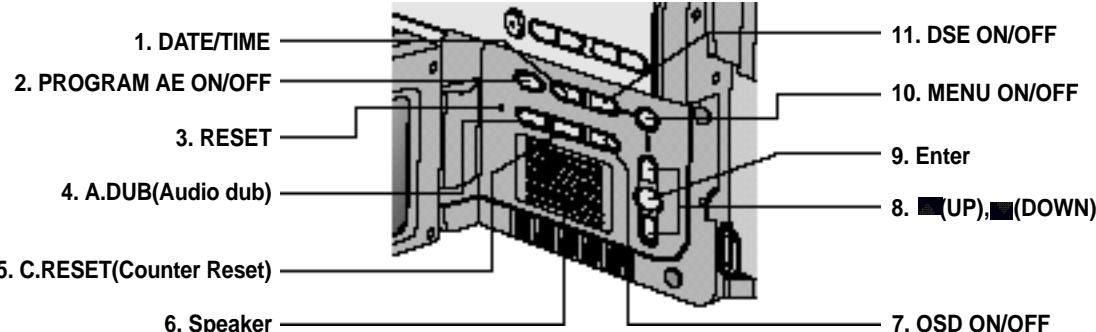
Front & Left View



- | | |
|------------------------------------|--|
| 1. Lens | 7. Auto Focus/Manual Focus select button (see page 46) |
| 2. Recording display light | 8. TFT LCD monitor |
| 3. Remote sensor | 9. I-BLC/BLC (see page 47) |
| 4. Hook for hand strap | 10. Fade (see page 48) |
| 5. External MIC input | 11. PIP (see page 49) |
| 6. Manual FOCUS dial (see page 47) | 12. Edit search +,- (see page 29) |

Getting to Know Your Camcorder

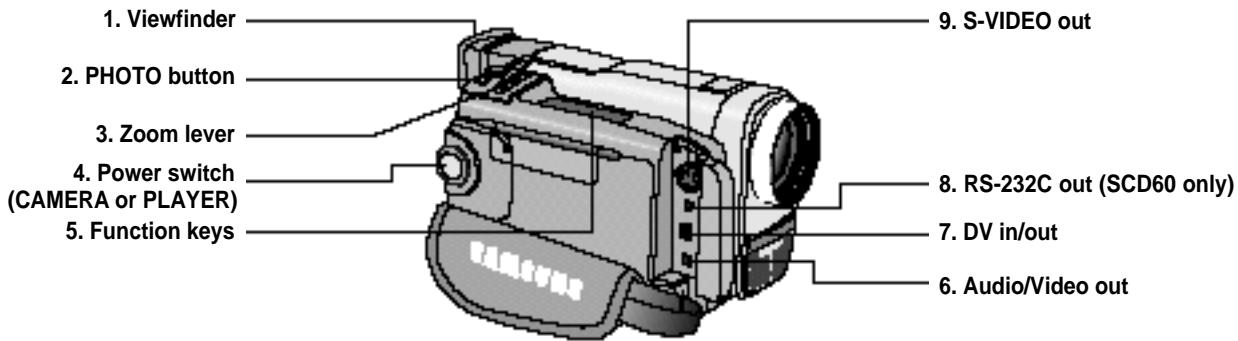
Left Side View



- 1. DATE/TIME (see page 45)
- 2. PROGRAM AE ON/OFF (see page 39)
- 3. RESET
 - All settings return to default.
- 4. A.DUB(Audio dub) (see page 50)
- 5. C.RESET(Counter Reset) (see page 38)
- 6. Speaker (see page 33)
- 7. OSD ON/OFF (see page 21)
- 8. □(UP), □(DOWN) (see page 34)
- 9. Enter (see page 34)
- 10. MENU ON/OFF (see page 34)
- 11. DSE ON/OFF (see page 41)

Getting to Know Your Camcorder

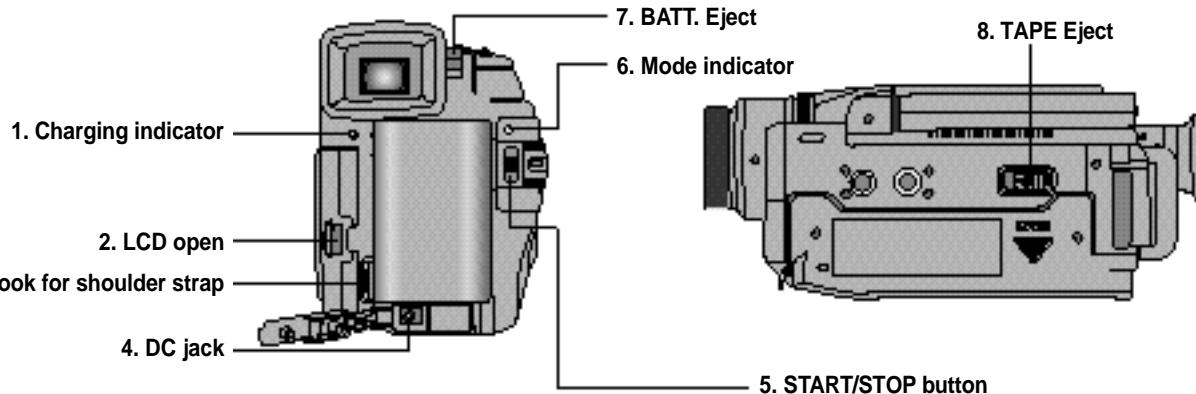
Right & Top View



- 1. Viewfinder (see page 31)
- 2. PHOTO button (see page 51)
- 3. Zoom lever (see page 36)
- 4. Power switch(CAMERA or PLAYER) (see page 24)
- 5. Function keys (see page 56) : PLAYER mode.
 - ◀◀ (REW)
 - ▶ [PLAY]
 - ▶▶ (FF)
 - (STOP)
 - II (STILL)
- 6. Audio/Video out (see page 55)
- 7. DV in/out (see page 58)
- 8. RS-232C out (SCD60 only, see page 61)
- 9. S-VIDEO out (see page 55)

Getting to Know Your Camcorder

Rear & Bottom View

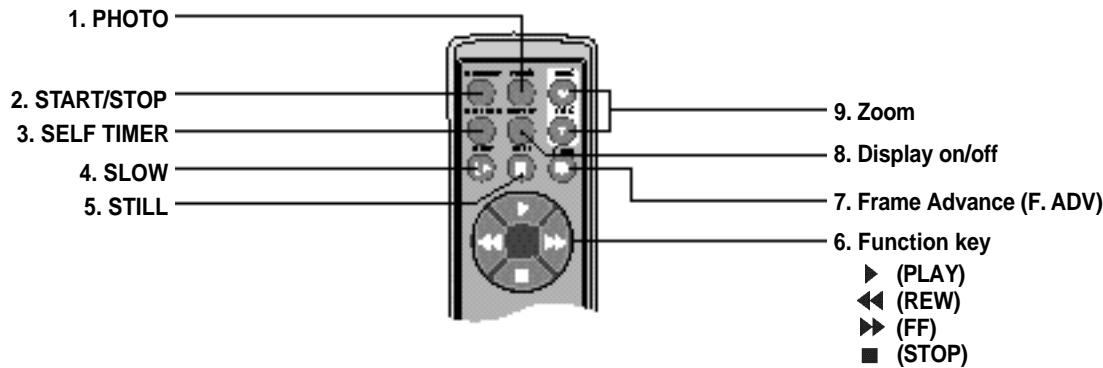


- 1. Charging indicator
- 2. LCD open
- 3. Hook for shoulder strap
- 4. DC jack
- 5. START/STOP button (see page 29)

- 6. Mode indicator
 - Red light : CAMERAmode
 - Green light : PLAYER mode
- 7. BATT.Eject
- 8. TAPE Eject

Getting to Know Your Camcorder

Remote control



- 1. PHOTO
- 2. START/STOP
- 3. SELF TIMER
- 4. SLOW (see page 57)
- 5. STILL (see page 57)
- 6. Function keys
 - ▶ (PLAY)
 - ◀ (REW)
 - ▷ (FF)
 - (STOP)

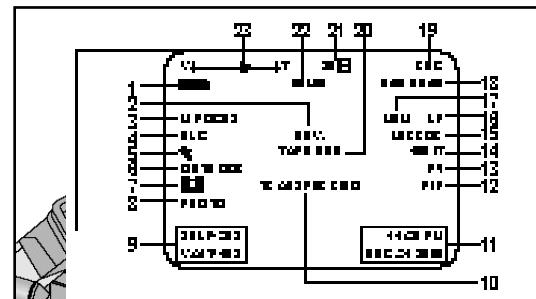
- 7. Frame Advance (F. ADV) (see page 57)
- 8. Display on/off
- 9. Zoom
 - TELE : Subject appears closer
 - WIDE : Subject appears farther away

Getting to Know Your Camcorder

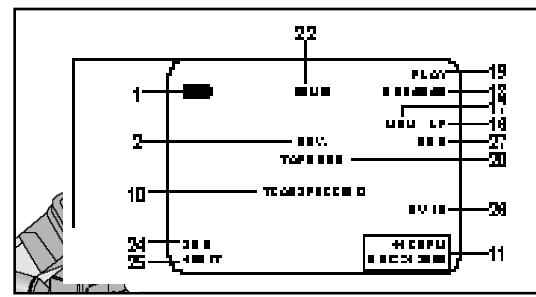
OSD (On Screen Display)

1. **Battery level** (see page 27)
2. **DEW condensation**
Monitors the moisture condensation.
3. **Manual focus** (see page 46)
4. **I-BLC,BLC** (see page 47)
(I-BLC for SCD60 only)
5. **Program AE** (see page 39)
6. **White Balance mode** (see page 42)
The White balance modes are AUTO, INDOOR and OUTDOOR.
7. **DIS** (see page 35)
Indicates the Digital Image Stabilizer is working.
8. **Photo** (see page 51)
9. **Self record and waiting timer indicators**
10. **DV-CAPTURE data transferring** (see page 60)
Indicates that the camcorder is transferring the digital still picture to your pc.
(SCD60 only)
11. **DATE/TIME** (see page 45)
12. **PIP** (Picture in Picture) (see page 49)
13. **Iris and Shutter speed** (see page 43)
14. **Audio record mode** (see page 44)
Indicates the Audio record mode. (12bit, 16bit)
12bit is not displayed.
15. **DSE (Digital Special Effect) mode**
(see page 40)
16. **Record speed mode**
Indicates the record speed.
17. **Zero memory** (see page 38)
Indicates that zero memory is working.
18. **Tape counter**
0:00:00 mark is linear-counter display, 0H00M00S00 mark is
TIME CODE display.
19. **Operation mode**
The operation modes are STBY, REC, PLAY, STOP, SLOW, STILL, F.ADV, FF, REW etc.

OSD in CAMERA mode



OSD in PLAYER mode



Getting to Know Your Camcorder

OSD (On Screen Display)

20. Self diagnosis (TAPE, TAPE END)

Checks the operation of the CAMCORDER.

21. Digital zoom mode (see page 36)

Indicates the digital zoom magnification mode. (2x, 20x)

22. Remaining Tape (measured in minutes)

23. Zoom position

24. Audio playback channel (see page 50)

Indicates the Audio playback channel. (MAIN, SUB)

MAIN is not displayed.

25. Audio playback mode

Indicates the audio playback mode. (12bit, 16bit)

12 bit is not displayed

26. DV IN (DV data receiving mode) (see page 58)

Indicates that the DV data receiving mode is activated.

27. DUB (see page 50)

Indicates that the audio dubbing is working.

Turning OSD (On Screen Display) on/off

• Turning OSD on/off

Press the OSD ON/OFF button on the left side panel.

- Whenever you press the button, it selects the function repeatedly in the order of (OFF → 0:00:00 → 0H00M00S00).

- When you turn off the OSD,

In CAMERAmode : You can view the OSD in the viewfinder or LCD monitor.

In PLAYER mode : If you press function keys (PLAY, STOP, FF, REW etc), the OSD is turned off after blinking for 3 seconds in the viewfinder and LCD monitor.

• Turning on/off the DATE/TIME

- The DATE/TIME is not affected by the OSD ON/OFF button.

- If you want to turn the DATE/TIME on or off, please use the DATE/TIME button on the left side panel.

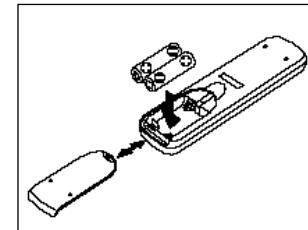
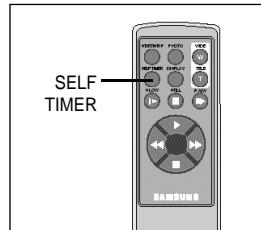
- Whenever you press the button, it selects the function repeatedly in the order of (OFF → DATE/TIME → TIME → DATE).

Getting to Know Your Camcorder

How to use the Remote Control

Battery Installation for the Remote Control

- ⌘ You must insert or replace these batteries when :
 - You purchase the camcorder.
 - The remote control doesn't work.
- ⌘ Insert two AA batteries, following the + and - markings.
- ⌘ Be careful not to reverse the polarity of the battery.



Self Record using the Remote Control

The Self Timer function on the remote control enables you to start and stop recording automatically.

Example : Scene with all members of your family

Two options are available

- WAIT-10S/SELF-30S : 10 second wait, followed by 30 seconds of recording.
- WAIT-10S/SELF-END : 10 second wait, followed by recording until you press the START/STOP button again.

1. Set the camcorder to CAMERA mode.
2. Press the SELF TIMER button until the appropriate indicator is displayed **in** the viewfinder :
 - WAIT-10S/SELF-30S
 - WAIT-10S/SELF-END
3. Press the START/STOP button to start the timer.
 - : After a 10 second wait, recording starts.
 - : If you have selected SELF-30S, recording stops automatically after 30 seconds.
 - : If you have selected SELF-END, press START/STOP again when you wish to stop recording.

Note

- When recording with the timer, you can press START/STOP a second time to cancel the function.

Preparing

Adjusting the Hand Strap and Shoulder Strap

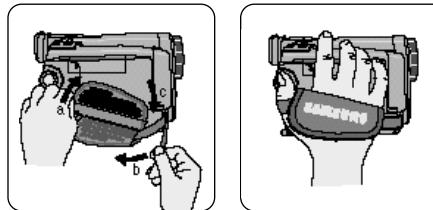
It is very important to adjust the hand strap for better recording.

The hand strap enables you to :

- Hold the camcorder in a stable, comfortable position.
- Press the Zoom and START/STOP button without having to change the position of your hand.

Hand strap

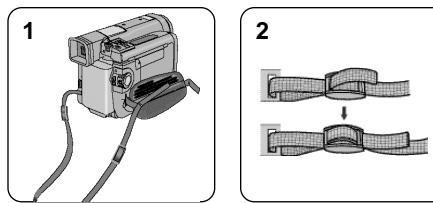
- a. Pull open the hand-strap cover and release the hand strap.
- b. Adjust its length and stick it back onto the hand strap cover.
- c. Close the hand strap cover back up again.



Shoulder Strap

The Shoulder Strap enables you to carry your camcorder around in complete safety.

1. Insert the end of the strap into the Shoulder Strap hook on the camcorder.
Insert the other end of the strap into the ring inside the hand strap.
2. Thread each end into the buckle, adjust the length of the strap and then pull it tight in the buckle.



Preparing

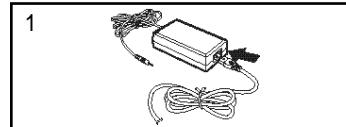
Connecting a Power Source

There are two power sources that can be connected.

- Using the AC Power Adaptor and AC cord : used for indoor recording.
- Using the Battery Pack : used for outdoor recording.

To use the AC Power Adaptor and DC Cable

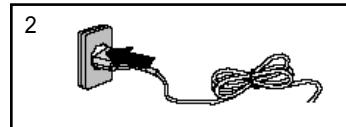
1. Connect the AC Power Adaptor to an AC cord.



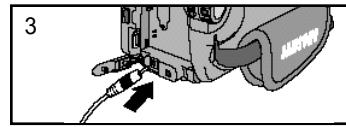
2. Connect the AC cord to a wall socket.

Note

- The plug and wall socket type may be different depending on the country you're in.

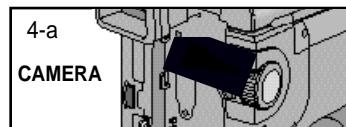


3. Connect the other end of the DC cable to the DC jack of the camcorder.



- 4-a. To set the camcorder to the CAMERAmode.

Hold down the tab of the power switch and turn the power switch to the CAMERA position.



- 4-b. To set the camcorder to the PLAYER mode.

Hold down the tab of the power switch and turn the power switch to the PLAYER position.



Preparing

To use the Lithium Ion Battery Pack

⌘ Amount of continuous recording time depends on :

- Which model of battery pack you are using.
 - How much you use the Zoom function.
- It is, therefore, recommended that you have several available.

Charging the Lithium Ion Battery Pack

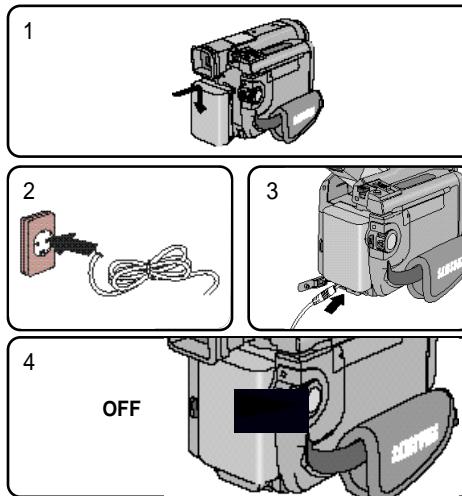
1. Attach the battery pack to the camcorder.

2. Connect the AC Power Adaptor to an AC cord
and connect the AC cord to a wall socket.

3. Connect DC cable to DC jack of the camcorder.

4. Turn off the power of the camcorder, and the charging indicator
will start blinking and begin charging.
 - Blinking once a second : Indicates less than 50% has been charged.
 - Blinking twice a second : Indicates 50% ~ 75% has been charged.
 - Blinking three times a second : Indicates 75% ~ 100% has been charged.
 - Blinking stops and stays on : Charging has been completed.
 - On for a second and off for a second: Indicates that an error has
occurred. Reset the battery pack and DC cable.

5. If charging is completed, separate the camcorder, AC power adapter,
and battery pack.
 - Even if the power is turned off, the battery will be discharged.



Note

-The battery pack may be charged a little at the time of purchase.

Preparing

Using the Lithium Ion Battery Pack

Table of continuous recording time based on model and battery type.

Model Battery	SCD55	SCD60
SB-L110	Approximately 50 minutes	Approximately 50 minutes
SB-L220	Approximately 100 minutes	Approximately 100 minutes

※ The continuous recording times given in the table are approximate. Actual recording time depends on usage.

Note

- The battery pack should be recharged in a room temperature that is between 32°F (0°C) and 104°F (40°C). It should never be charged in a room temperature that is below 32°F (0°C).
- The life and capacity of the battery pack will be reduced if it is used in temperatures below 32°F (0°C), even when it is fully recharged.
- The life and capacity of the battery pack will be reduced if the battery pack is left in temperatures above 104°F (40°C) for a long period, even when it is fully recharged.
- Do not put the battery pack near any heat source (fire or flames, for example).
- Do not disassemble, process, pressure, or heat the Lithium Ion Battery Pack.
- Do not allow metal substances to contact the + and – terminals of the Lithium Ion Battery Pack.
It can cause leakage, heat generation, induction of fire and overheating.

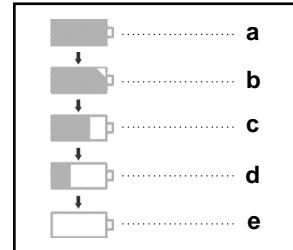
Preparing

Battery level display

- The battery level display indicates the amount of power remaining in the battery pack.

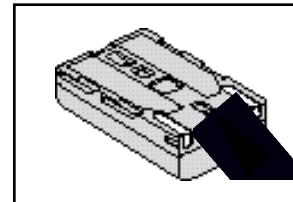
- a.Fully charged
- b.10% used
- c. Half used
- d.Mostly used
- e.Completely used (flickers)
(camcorder will turn off soon, change the battery as soon as possible)

- Please refer to the table on page 26 for approximate continuous recording times.
- The recording time is affected by environmental temperature and conditions.
The recording time becomes very short in a cold environment.
The continuous recording time in the operating instructions is measured under the condition of using a fully charged battery pack at 77°F(25°C). As the environmental temperature and conditions may be different when you actually use the camcorder, the remaining battery time may not be the same as the approximate continuous recording times given in these instructions.



Tips for Battery Identification

- A charge mark is provided on the battery pack to help you remember whether it has been charged or not.
Two colors are provided (red and black)-you may choose which one indicates charged and which indicates discharged.



Note

- The Charge mark setting does not affect the battery's charge status.

Preparing

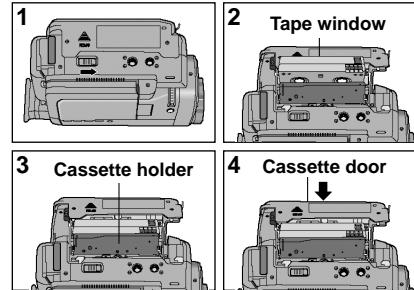
Inserting and Ejecting a Cassette

- ⌘ There are three types of Mini DV CASSETTE tapes: DVM80, DVM60, and DVM30.
- ⌘ When inserting a tape or closing a cassette holder, do not apply excessive force. It can cause a malfunction.
- ⌘ Do not use tapes other than the Mini DV CASSETTE.

Your camcorder inserts and ejects a tape automatically.

Do not be hasty. Wait until the tape is fully inserted or ejected.

1. Slide the TAPE EJECT button located beneath the camcorder forwards and open the cassette door.
- The compartment opens automatically.
2. Insert a tape into the cassette holder with the tape window facing outward and the protection tab toward the top.
3. Push the PUSH mark until the compartment clicks into place.
4. Close the cassette door.
- When the cassette door is open, the camcorder will not operate.



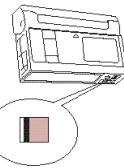
Note

- When you have recorded a cassette that you wish to keep, you can protect it so that it will not be accidentally erased.

a. Recording Impossible(Protection) :

Push the protection tab on the cassette so that it does not cover up the opening.

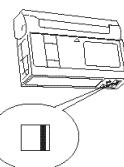
a. SAVE



b. Recording possible :

If you no longer wish to keep the recording on the cassette, push the protection tab back so that it no longer covers up the opening.

b. REC



• How to keep a tape

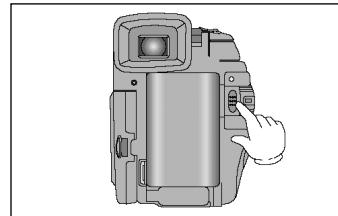
- a. Avoid places where there are magnets.
- b. Avoid humidity-and-dust prone places.
- c. Keep it in an erect position away from the direct sunlight.
- d. Do not drop the tape.

Basic Recording

Making your First Recording

Make sure that you make these preparations.

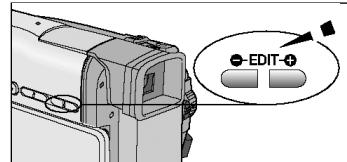
- Did you connect a power source? (Battery Pack or DC cable)
- Did you set the Power switch to the CAMERA position?
- Did you insert a cassette?
- Open the LCD monitor and make sure that STBY is displayed in the OSD. (If the protection tab of the cassette is opened, STOP will be displayed)
- If you want to see the image in the Viewfinder, close the LCD monitor.
- Did you open the LENS CAP?
- Make sure the image you want to record appears in the LCD monitor or Viewfinder.
- Make sure the battery level indicates that there is enough remaining power for recording.
 - To start recording, press the START/STOP button.
Recording starts and REC is displayed on the LCD.
 - To stop recording, press the START/STOP button again.
Recording stops and STBY is displayed on the LCD.



When a cassette is loaded and the camcorder is left in the STBY mode for over 3 minutes without being used, it will switch off automatically. To use it again, push the START/STOP button or set the Power switch to OFF and then back to CAMERA. This Auto Power off feature is designed to save battery power.

Edit Search

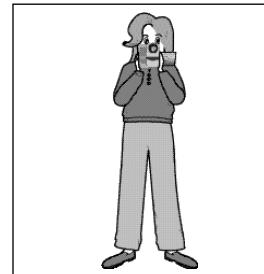
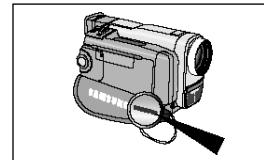
- ⌘ You can view a recorded scene with the EDIT +, – function in STBY mode. EDIT – enables you to reverse and EDIT + enables you to forward, for as long as you keep pressing.
- ⌘ If you press the the EDIT – button quickly in STBY mode, your camcorder will play back in reverse for 3 seconds and return to the original position automatically.



Basic Recording

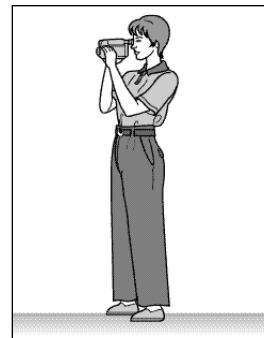
Hints for Stable Image Recording

- While recording, it is very important to hold the camcorder correctly.
- Fix the LENS cap firmly by clipping it on the hand strap. (refer to figure)



Recording with the LCD monitor

1. Hold the camcorder firmly using the hand strap.
2. Place your right elbow against your side.
3. Place your left hand under or beside the LCD to support and adjust it.
Do not touch the built-in microphone.
4. Choose a comfortable, stable position for the shots that you are taking.
You can lean against a wall or on a table for greater stability.
Do not forget to breathe gently.
5. Use the LCD frame as a guide to determine the horizontal plane.
6. Whenever possible, use a tripod.



Recording with Viewfinder

1. Hold the camcorder firmly using the hand strap.
2. Place your right elbow against your side.
3. Place your left hand under the camcorder to support it.
Be sure not to touch the built-in microphone.
4. Choose a comfortable, stable position for the shots that you are taking.
You can lean against a wall or on a table for greater stability.
Do not forget to breathe gently.
5. Place your eye firmly against the viewfinder eyecup.
6. Use the viewfinder frame as a guide to determine the horizontal plane.
7. Whenever possible, use a tripod.

Basic Recording

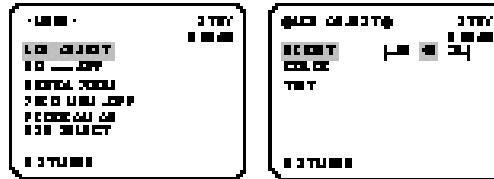
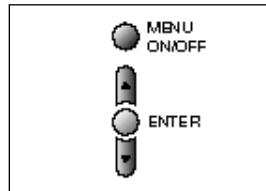
Adjusting the LCD

Your camcorder is equipped with a 2.5 inch color Liquid Crystal Display(LCD) screen, which enables you to view what you are recording or playing back directly.

Depending on the conditions in which you are using the camcorder (indoors or outdoors for example), you can adjust ;

- Brightness
- Color
- Tint

1. Set the POWER switch to CAMERAO or PLAYER position.
2. Open the LCD monitor, the LCD is turned on.
3. Press the MENU ON/OFF button.
4. Press the **[■], [■]** buttons so that LCD ADJUST is highlighted.
5. Press the ENTER button.
 - Using the **[■], [■]** buttons, select a menu item you want to adjust.
6. Press the ENTER button again.
 - Using the **[■], [■]** buttons, adjust the color, brightness or tint levels.
7. Press the MENU ON/OFF button to finish the LCD ADJUSTMENT.



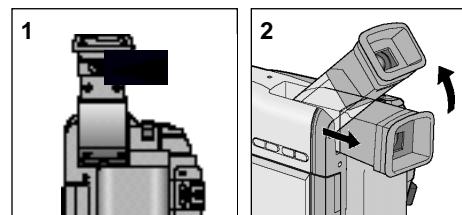
Using the VIEWFINDER

Adjusting the Focus

Use the focus adjustment knob of the VIEWFINDER to focus the picture.
(refer to figure 1)

Using the VIEWFINDER

Take care if you use a large battery pack that obstructs the VIEWFINDER's movement.
(refer to figure 2)



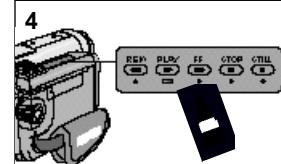
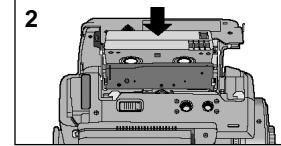
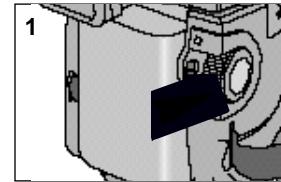
Basic Recording

Playing back a tape you have recorded on the LCD

- ⌘ You can monitor the playback picture on the LCD monitor.
 - ⌘ Make sure that the battery pack is in place.
1. While pressing the red button on the Power switch, set it to PLAYER position.
 2. Insert a tape you have just recorded.
 3. Open the LCD monitor and make sure that STOP is displayed in the OSD.
Adjust the angle of the LCD monitor and set the brightness or the color if necessary.
 4. Press the **◀◀ (REW)** button to rewind the tape to the start point.
 - To stop REWIND, press the **■ (STOP)** button.
 - Camcorder changes to STOP mode automatically when the tape has reached its end position after rewinding.
 5. Press the **▶ (PLAY)** button to start play back.
 - You can see the picture you recorded on the LCD.
 - To stop the PLAY operation, press the **■ (STOP)** button.

Note

- You can also monitor the picture on a TV screen, after connecting the camcorder to a TV or VCR (see page 55)
- You can use various functions in playback mode.
(STILL, SLOW, F.ADV, PICTURE SEARCH) (see page 57)



Basic Recording

Adjusting the LCD during PLAY

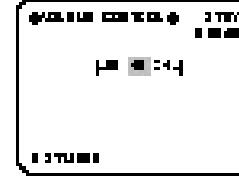
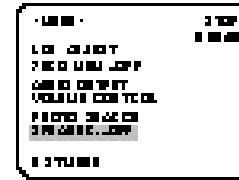
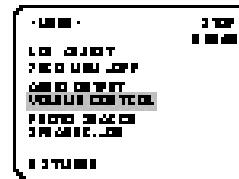
- ⌘ You can adjust the LCD during PLAY.
- ⌘ The adjustment method is the same as with the CAMERAOperation. (see page 31)

Controlling Sound from the Speaker

The Speaker works in PLAYER mode only.

- When you use the LCD monitor while playing back, you can hear sound from the Speaker.
- If you do not want to hear sound from the Speaker, set the SPEAKER to OFF in the Menu using the ENTER button.
- The volume of the Speaker is controlled by the VOLUME CONTROL in the menu.

1. Press the MENU ON/OFF button.
2. Press the **[◀]** **[▶]** buttons so that VOLUME CONTROL is highlighted.
3. Press the ENTER button.
- Using the **[◀]** **[▶]** buttons adjust the volume level.
4. Press the MENU ON/OFF button to finish the VOLUME CONTROL.
- If you close the LCD monitor, the LCD monitor and speaker turn off.
- If the speaker does not work properly, check these points;
■ Is the LCD monitor closed?
■ Is the volume adjusted to a low level?
■ Is the SPEAKER menu set to OFF?



Advanced Recording

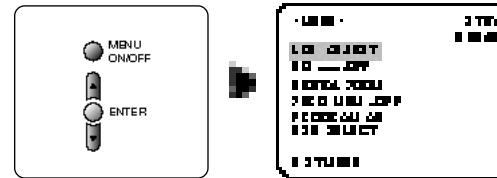
Using Various Functions

Setting the menu item

	CAMERA mode	PLAYER mode
Functions in menu	LCD ADJUST, DIS, DIGITALZOOM, ZERO MEM, PROGRAM AE, DSE, WHITE BALANCE, SHUTTER SPEED, IRIS, AUDIO MODE, PHOTO MODE, CLOCK SETTING	LCD ADJUST, ZERO MEM, AUDIO OUTPUT, VOLUME CONTROL, PHOTO SEARCH, SPEAKER

- Set the camcorder to CAMERA or PLAYER mode.

1. Press the MENU ON/OFF button.
The MENU OSD is displayed.
The cursor **highlights** the feature you can set.
2. Using the **■ □** and ENTER buttons on the left side panel, select and activate the item.
3. You can exit the menu mode by pressing the MENU ON/OFF button.



Note

- If you leave the camcorder set to MENU for more than 30 seconds, the MENU OSD turns off automatically.
- If the menu item displays **DISABLE** for some functions, you can not change that menu item.
- When you set the IRIS mode to manual(not AUTO)mode, you cannot change the PROGRAM AE and SHUTTER SPEED modes.
 - The PROGRAM AE and SHUTTER SPEED modes will be changed to AUTO.
- When you set the SHUTTER SPEED mode to manual (not AUTO) mode, you cannot change the PROGRAM AE mode.
 - The PROGRAM AE mode will be changed to AUTO.

Advanced Recording

LCD ADJUST

- The LCD ADJUST function works in CAMERA and PLAYER mode.
Please see page 31.

DIS (Digital Image Stabilizer)

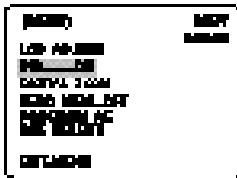
- The DIS function works in CAMERAmode only.
- DIS(Digital Image Stabilizer) is a handshake compensation function that compensates for any shaking or moving of the hand holding the camcorder (within resonable limits).
- It provides more stable pictures when:
 - Recording in the Zoom in mode
 - Recording a small object close-up
 - Recording and walking at the same time
 - Recording through the window of a vehicle

1. Set the camcorder to CAMERA mode.

2. Press the MENU ON/OFF button.

- The menu list will appear.

3. Using the **[], []** buttons, highlight DIS.



4. To activate the DIS function, press the ENTER button.

- The DIS menu is changed to ON.

- If you do not want to use the DIS function, set the DIS menu to OFF.

5. To exit, press the MENU ON/OFF button.

Note

- It is recommended that you deactivate the handshake compensation function when using a tripod.
- The DIS function will not operate in the PHOTO or GHOST(in DSE) mode.
- If you use the DIS function, the picture quality may deteriorate.

Advanced Recording

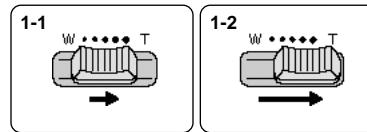
Zooming In and Out with DIGITAL ZOOM

- ⌘ Zoom works in CAMERA mode only.

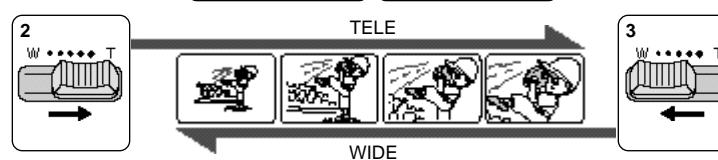
Zooming In and Out

- ⌘ Zooming is a recording technique that lets you change the size of subject in the scene.
For more professional looking recordings, do not use the zoom function too often.
- ⌘ You can zoom using a variable zoom speed.
- ⌘ Use these features for different shots; Please note that over use of the zoom feature can lead to unprofessional looking results and a reduction of battery pack usage time.

1. Move the zoom lever a little for a gradual zoom,
move it further for a high-speed zoom.
Your zooming is monitored on the OSD.



2. T(Telephoto) side:
Subject appears closer.
3. W(Wide angle) side:
Subject appears farther away.

**Note**

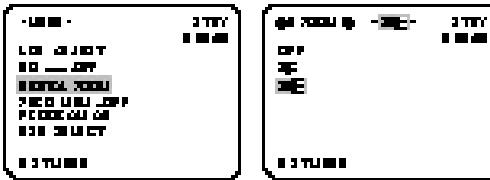
- You can record a subject that is at least 1 m (about 2.65 feet) away from the lens surface in the TELE position, or about 10 mm (about 0.5 inch) away in the WIDE position.

Advanced Recording

Digital Zoom

- ⌘ Zooms more than 22x are performed digitally.
- ⌘ The picture quality deteriorates as you go toward the "T" side.
- ⌘ We recommend that you use the DIS feature with the DIGITAL ZOOM for picture stability.

1. Set the camcorder to CAMERA mode.
2. Press the MENU ON/OFF button.
 - The menu list will appear.
3. Using the **◀ ▶** buttons, highlight DIGITAL ZOOM.
4. Press the ENTER button to enter the select mode.
5. Using the **◀ ▶** buttons, highlight your chosen digital zoom magnification(2x or 20x).
 - Press the ENTER button to activate the digital zoom.
 - If you exit the menu without pressing the ENTER button, the DIGITAL ZOOM mode is not changed.
6. To exit, press the MENU ON/OFF button.

**Note**

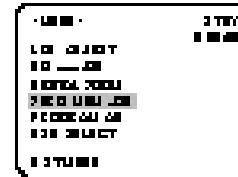
- The DIGITAL ZOOM function will not operate in the PHOTO mode.
- If you use the digital zoom function, the picture quality may deteriorate.

Advanced Recording

ZERO MEMORY

- ⌘ The ZERO MEMORY (ZERO MEM) function works in CAMERAand PLAYER mode.
- ⌘ You can FAST Forward or Rewind or Record to 0:00:00 automatically.

- 1.Press the MENU ON/OFF button.
- The menu list will appear.
- 2.Using the buttons, highlight ZERO MEM.
- 3.To activate the ZERO MEM function, press the ENTER button.
- The ZERO MEM menu is changed to ON.
- If you press the FF or REW or START/STOP, operation will automatically stop at the counter 0:00:00.
4. To exit, press the MENU ON/OFF button.



Note

- In the following situations, the ZERO MEM mode may be canceled automatically.
- At the end of the video insertion.
- When selecting the power switch for another mode or the power has been turned off.
- When the tape is ejected.

Video insertion

- ⌘ To replace unwanted images and audio with new images, you can use the Video insertion function.
1. Set the Power Switch to the CAMERAmode.
 - 2.Press the EDIT +,- buttons to find the end position of the scene to be inserted.
 - 3.Press the C.RESET button to let the counter become 0:00:00.
 - 4.Press the EDIT - button to find the beginning of the scene to be inserted.
 - 5.Press the MENU ON/OFF button.
- Using the and the ENTER buttons, set the ZERO MEM to ON.
 - 6.Press the START/STOP button.
- The new image and audio will be inserted and recorded.
- The recording will stop automatically at the counter 0:00:00 position.
During the recording, MEM is displayed on the OSD.

Advanced Recording

PROGRAM AE

The PROGRAM AE function works in CAMERA mode only.

The PROGRAM AE modes allow you to adjust shutter speeds and apertures to suit different recording conditions. They give you creative control over the depth of the field.

■ AUTO mode

- Auto balance between the subject and the background.
- To be used in normal conditions.
- The shutter speed automatically varies from 1/60 to 1/250 second, depending on the scene.

■ PORTRAIT mode ()

- For focusing on the background of the subject, when the background is out of focus.
- The PORTRAIT mode is most effective when used outdoors.
- The shutter speed automatically varies from 1/60 to 1/1000 second.

■ SPORT mode ()

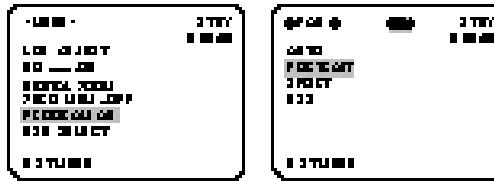
- For recording people or objects moving quickly.

■ HSS mode ()

- For recording fast-moving subjects such as golfers or tennis players.

Setting the PROGRAM AE

1. Press the MENU ON/OFF button.
- The menu list will appear.
2. Using the   buttons, highlight PROGRAM AE.
3. Press the ENTER button to enter the select mode.
4. Using the   buttons, select and highlight a PROGRAM AE mode.
 - Press the ENTER button to confirm the program AE mode.
 - If you exit the menu without pressing the ENTER button, the PROGRAM AE mode is not changed.
5. To exit, press the MENU ON/OFF button.
6. You can switch the selected mode on or off in PROGRAM AE with PROGRAM AE ON/OFF button.



Advanced Recording

DSE(Digital Special Effects)

- ⌘ The DSE function works in CAMERAmode only.
- ⌘ The digital effects enable you to give a creative look to your recording by adding various special effects.
- ⌘ Select the appropriate digital effect for the type of picture that you wish to record and the effect that you wish to give.
- ⌘ There are 6 DSE modes.

a.NEGA mode

This mode changes the image to look like a film negative.



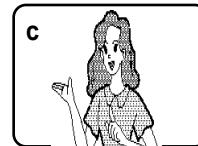
b.B/W mode

This mode changes the image to black and white.



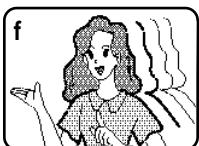
c. WIDE mode

This mode changes the image to WIDE (16:9) television display.



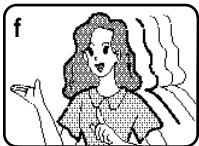
d.MOSAIC mode

This mode gives the image a mosaic effect.



e.MIRROR mode

This mode cuts the image in half, using a mirror effect.



f. GHOST mode

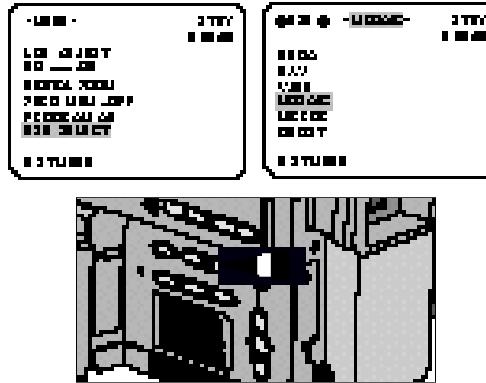
This mode gives the image a dragging effect.



Advanced Recording

Selecting an effect

1. Press the MENU ON/OFF button.
 - The menu list will appear.
2. Using the buttons, highlight DSE SELECT.
3. Press the ENTER button to enter the select mode.
4. Using the buttons, highlight and select a DSE mode.
 - Press the ENTER button to confirm the DSE mode.
 - If you exit the menu without pressing the ENTER button, the DSE mode is not changed.
5. To exit, press the MENU ON/OFF button.
6. You can switch the selected mode on or off in DSE with the DSE button.

**Note**

- MOSAIC and MIRROR function will not operate in PIP mode. (see page 49)
- GHOST function will not operate in DIS and PHOTO mode.

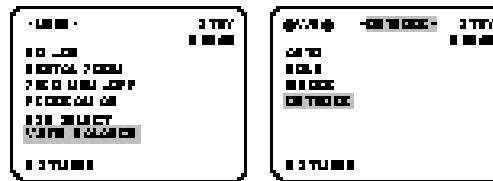
Advanced Recording

WHITE BALANCE

- The WHITE BALANCE function works in CAMERA mode only.
- The WHITE BALANCE is a recording function that preserves the unique color or the object in any recording condition.
- You may select the appropriate WHITE BALANCE mode to obtain good quality color of the image.

- AUTO : This mode is generally used to control the WHITE BALANCE automatically.
- HOLD : Fixes the current WHITE BALANCE value.
- INDOOR : Controls WHITE BALANCE according to the indoor ambience.
- OUTDOOR : Controls WHITE BALANCE according to the outdoor ambience.

1. Press the MENU ON/OFF button.
 - The menu list will appear.
2. Using the **[], []** buttons, highlight WHITE BALANCE.
3. Press the ENTER button to enter the select mode.
4. Using the **[], []** buttons, highlight and select WHITE BALANCE mode.
 - Press the ENTER button to confirm the WHITE BALANCE.
 - If you exit the menu without pressing the ENTER button,
the WHITE BALANCE mode is not changed.
5. To exit, press the MENU ON/OFF button.

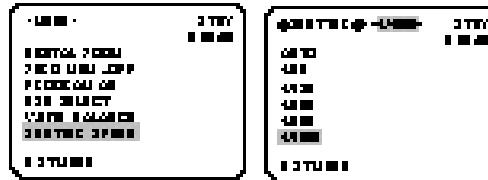


Advanced Recording

SHUTTER SPEED

- ⌘ The SHUTTER SPEED function works in CAMERA mode only.
- ⌘ The shutter speed can be controlled, allowing you to record both fast and slow moving objects.
- You can select one of following:
AUTO, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 second.
AUTO is fixed at 1/60 second.

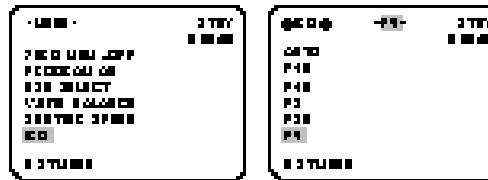
1. Press the MENU ON/OFF button.
- The menu list will appear.
2. Using the **◀▶** buttons, highlight SHUTTER SPEED.
3. Press the ENTER button to enter the select mode.
4. Using the **◀▶** buttons, highlight the SHUTTER SPEED mode.
 - Press the ENTER button to confirm the SHUTTER SPEED.
 - If you exit the menu without pressing the ENTER button,
the SHUTTER SPEED mode is not changed.
5. To exit, press the MENU ON/OFF button.



IRIS

- ⌘ The IRIS function works in CAMERAmode only.
- ⌘ The IRIS controls the quantity of light entering through the lens.
- ⌘ If you select a low value, the iris will be opened more.
If you select a high value, the iris will be closed more.
- You can select one of following:
AUTO, F1.6, F1.8, F2, F2.8, F4, F5.7, F8, F11.3, F16, CLOSE
(The IRIS values can be changed according to zoom position.)
AUTO : It selects the iris value for the proper exposure.

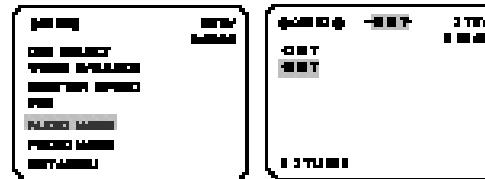
* The IRIS selecting method is the same as the SHUTTER SPEED mode.



Advanced Recording

AUDIO MODE

- ☒ The AUDIO MODE function works in CAMERA mode only.
- ☒ This camcorder records the sound in two ways. (12BIT, 16BIT)
 - 12BIT : You can record two 12bit stereo sound tracks.
The original stereo sound can be recorded onto the MAIN track.
Additional stereo sound can be dubbed onto the SUB track.
 - 16BIT : You can record one high quality stereo sound using the 16bit recording mode. Audio dubbing is not possible when using this mode.



1. Press the MENU ON/OFF button.
 - The menu list will appear.
2. Using the [] buttons, highlight the TAPE SPEED.
3. Press the ENTER button to enter the select mode.
4. Using the [] buttons, highlight your chosen TAPE SPEED.
 - Press the ENTER button to confirm the TAPE SPEED.
 - If you exit the menu without pressing the ENTER button,
the TAPE SPEED mode is not changed.
5. To exit, press the MENU ON/OFF button.

Advanced Recording

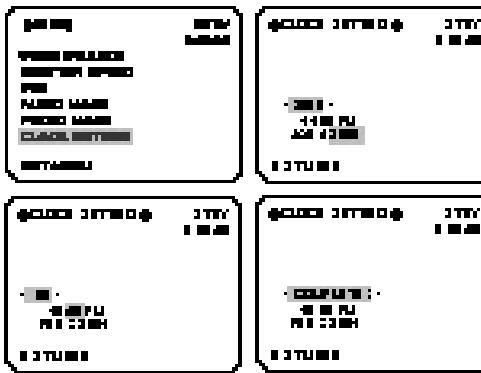
CLOCK SETTING (DATE/TIME)

- ⌘ Setting the CLOCK feature works in CAMERA mode.
- ⌘ The DATE/TIME is automatically recorded on a tape.
Before recording, please set the DATE/TIME.

1. Press the MENU ON/OFF button.
- The menu list will appear.
2. Using the [] buttons, highlight CLOCK SETTING.
3. Press the ENTER button to enter the SETTING mode.
- BLINKING indicates the possible changes for the setting.
The year will be the first to blink.
4. Using the [] buttons, change the year setting.
5. Press the ENTER button.
- The month to be reset will blink.
6. Using the [] buttons, change the month setting.
7. Press the ENTER button.
- The day to be reset will blink.
8. You can set the day, hour and minute following the same procedure used for setting year and month.
9. Press ENTER after setting the minute.
- The COMPLETE! OSD will be blinking and a few minutes later, the date/time setting screen will disappear.

- **Tuning on/off the DATE/TIME**

- If you want to turn on and off the DATE/TIME, please use the DATE/TIME button on the left side panel.
- Whenever you press the button, it selects the function repeatedly in the order of (OFF → DATE/TIME → TIME → DATE).



Advanced Recording

AF/MF (Auto Focus/Manual Focus)

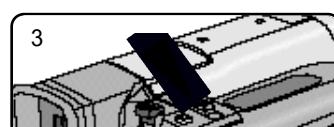
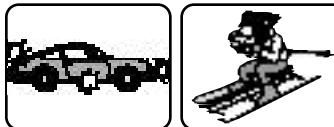
- ⌘ The AF/MF function works in CAMERAmode only.
- ⌘ In most situations, it is better to use the Automatic Focus feature, as it enables you to concentrate on the creative side of your recordings.
- ⌘ Manual focusing may be necessary under certain conditions that make automatic focusing inadequate.

Auto Focusing

- ⌘ The AF (Auto Focus) mode is set automatically when you switch on the Power switch.
- ⌘ If you are inexperienced with camcorders, we recommend that you use the Auto Focus mode.

Manual Focusing

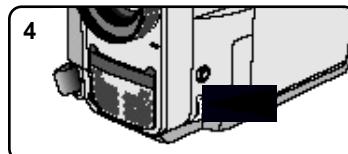
- ⌘ In the following cases you should obtain better results by adjusting the focus manually.
- a. A picture containing several objects, some close to the camcorder, others further away.
- b. A person enveloped in fog or surrounded by snow.
- c. Very shiny or glossy surfaces like a car.
- d. People or objects moving constantly or quickly like an athlete or crowd.



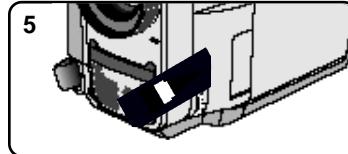
1. Set power switch to CAMERA mode.
2. Press AF/MF button.
3. Zoom in the subject to be shot by pushing ZOOM lever to the "T" side.

Advanced Recording

4. Turn MF dial up or down until the object is focused.
 - You can get a sharp picture after zooming out.



5. To return to AF(Auto Focus), press MF button again.



I-BLC (SCD60 only)/BLC

I-BLC or BLC works in CAMERA mode.

Back lighting exists when the subject is darker than the background:

- The subject is placed in front of a window.
- The person to be recorded is wearing white or shiny clothes and is placed against a bright background; the person's face is too dark to distinguish their features.
- The person to be recorded is wearing white or shiny clothes and is placed against a bright background; the person's face is too dark to distinguish their features.
- The subject is outdoors and the background is overcast.
- The light sources are too bright.
- The subject is against a snowy background.

1. Set power switch to CAMERA mode.

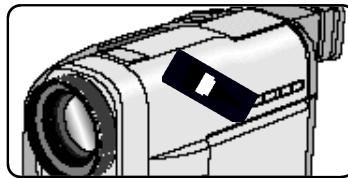
2. Press I-BLC/BLC button.

- Normal - I-BLC - BLC - Normal (SCD60)
- Normal - BLC - Normal (SCD55)
- I-BLC enhances the subject and background.
- BLC enhances only the subject.

* I-BLC or BLC off



* I-BLC or BLC on



Advanced Recording

- ⌘ The FADE function works in CAMERA mode only.
- ⌘ You can give your films a professional look by using special effects such as fade in at the beginning of a sequence or fade out at the end of a sequence.

To Start Recording

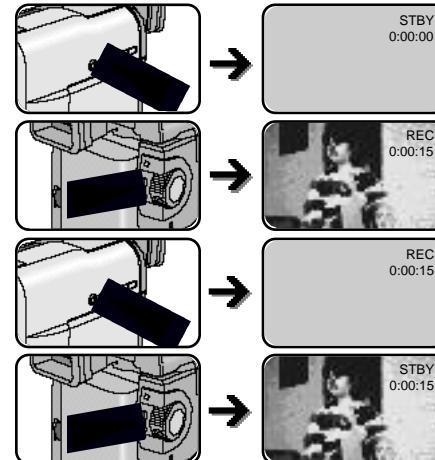
1. Before recording, hold down the FADE button.
The picture and sound gradually disappear (fade out).
2. Press the START/STOP button and at the same time release the FADE button.
Recording starts and the picture and sound gradually appear (fade in).

To Stop Recording (use FADE IN / FADE OUT)

3. When you wish to stop recording, hold down FADE button.
The picture and sound gradually disappear (fade out).
4. When the picture has disappeared, press the START/STOP button to stop recording.

a. FADE OUT
(Approx. 4 seconds)

b. FADE IN
(Approx. 4 seconds)



Press the FADE button

a. FADE OUT

Gradual disappearance



Gradual appearance



b. FADE IN



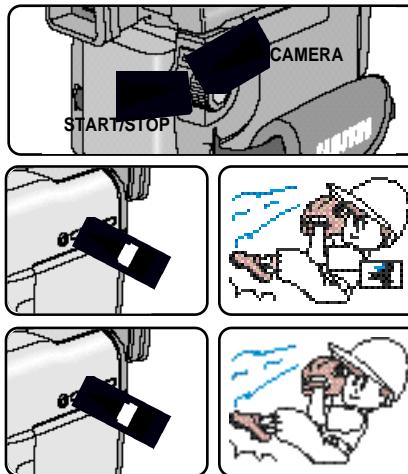
Release the FADE button

Advanced Recording

PIP (Picture-in-Picture)

- ⌘ The PIP (Picture-in-Picture) function works in CAMERAmode only.
- ⌘ The PIP feature works by using a small, superimposed screen of the original image. This should help you to get a more clear idea of what you are recording.

1. Set power switch to CAMERA mode.
2. Press the PIP button. A small screen should appear.
3. Turn on the various functions.
4. Check which part you are recording on the PIP screen.
5. To exit, press the PIP button again.
The small screen will disappear.

**Note**

- When you use the PIP function, the PIP screen will be on the recording.
- The PIP function will not operate in the MOSAIC or MIRROR mode. (in DSE).

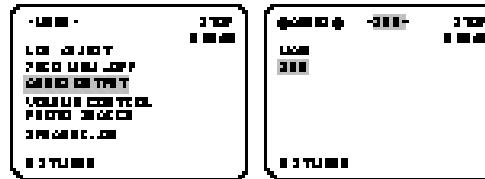
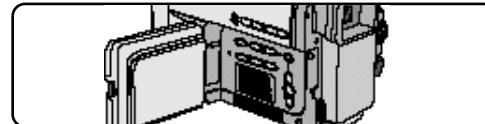
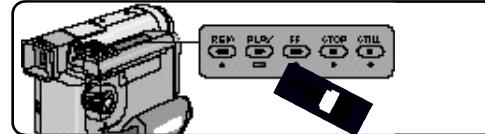
Advanced Recording

Audio dubbing

- ⌘ The AUDIO DUBBING function works in PLAYER Mode.
- ⌘ You can record an audio track to add to the original sound on a tape by using a microphone or by connecting audio equipment.
- ⌘ The original sound will not be erased.

Dubbing sound with a microphone

1. Press ▶ (PLAY) button and find the first position of the scene to be dubbed.
2. Press ■ (STILL) button at the dubbing start position.
3. Press A.DUB button.
 - DUB will be displayed in the viewfinder.
 - The camcorder is in a ready-to-dub state for dubbing.
4. Press the ▶(PLAY) button to start dubbing.
 - Press ■ (STOP) button to stop the dubbing.



Playing back dubbed Audio

1. Insert the dubbed tape.
2. Press the MENU button.
3. Using the , buttons, highlight AUDIO OUTPUT and press the ENTER button.
4. Using the , button, select SUB and press the ENTER button.
 - SUB and press the ENTER button.
 - If you want to hear the original sound, select MAIN.

Note

- You can not dub audio on a tape recorded in 16BIT mode.

Advanced Recording

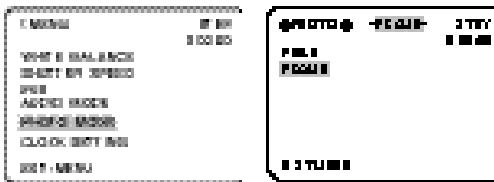
PHOTO

- ⌘ The PHOTO function works in CAMERA mode only.
- ⌘ With the PHOTO feature, your camcorder can function like a normal film camera, allowing you to take single pictures.
- ⌘ You can select one of these PHOTO modes:
 - FIELD : You can record a normal resolution still picture.
 - FRAME: You can record a high resolution still picture.
 - If you record a fast moving subject in this mode, you may get a duplicated still picture.
 - We recommend you use this mode to record a motionless picture.

1. Set power switch to CAMERA mode.

2. Press the MENU ON/OFF button.
-The menu list will appear.

3. Using the buttons, highlight PHOTO MODE.



4. Press the ENTER button to enter the select mode.

5. Using the buttons, highlight and select your chosen PHOTO mode.
- Press the ENTER button to confirm the PHOTO mode.
- If you exit the menu without pressing the ENTER button, the PHOTO mode is not changed.

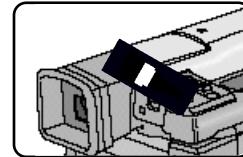
6. To exit, press the MENU ON/OFF button.

Advanced Recording

Taking a still picture

1. Press the PHOTO button.

- The still picture appears on the LCD monitor or viewfinder.
 - To quit the PHOTO mode without recording, press the PHOTO button again.
2. Press the START/STOP button.
- The still picture is recorded for about 8 seconds.
3. After the PHOTO recording, PHOTO mode is canceled.



Note

- To record the still picture, you must press the START/STOP button.
- The PHOTO function will not operate in the GHOST mode(in DSE).

Searching the PHOTO picture

⌘ The PHOTO SEARCH works in PLAYER mode only.

1. Press the MENU ON/OFF button.

- The menu list will appear.

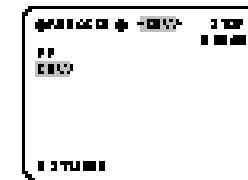
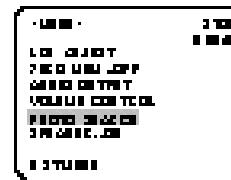
2. Using the buttons, highlight PHOTO SEARCH.

3. Press the ENTER button to enter the select mode.

4. Using the buttons, highlight the search direction.

- Press the ENTER button.

- After searching, the camcorder displays the still image and the menu is automatically turned off.



Advanced Recording

Various Recording Techniques

⌘ In some situations different recording techniques may be required for more dramatic results.

Note

- Please rotate the LCD screen carefully.
Unintended rotation may cause damage to the inside of the hinge that connects the LCD screen to the Camcorder.

1. General recording



2. Downward recording

Making a recording by looking at the LCD screen from the top.



3. Upward recording

Making a recording by looking at the LCD screen from the bottom.



4. Self record

Making a recording by looking at the LCD screen from the front.

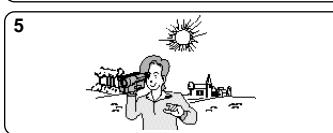
Note

- When the LCD screen faces front, indications are turned off.



5. Recording with Viewfinder

■ In circumstances where it is difficult to use the LCD monitor, the viewfinder can be used as a convenient alternative.



Advanced Recording

Lighting Techniques

- ⌘ When you use your camcorder, there are two main situations.
 - You will be recording outdoors (Normal recording or use of a ND (Neutral Density) filter).
 - You will be recording indoors (Video light recommended or required).
- ⌘ The single greatest influence on picture quality is the level of brightness, measured in lux.
- ⌘ The following table lists a few common situations, the corresponding level of brightness and any associated recommendations.

Situations	Brightness(Lux)	Recommendations
• Snow-covered mountains or fields. • Sandy beach on a hot summer's day.	100,000	ND filter recommended.
• Sunny around midday. • Sunny day in the middle of the afternoon. • Overcast day around midday. • Overcast day one hour after sunrise. • Office with fluorescent lighting near to a window. • Sunny day one hour before sunset. • Department store counter. • Station ticket counter.	100,000 35,000 32,000 2,000 1,000 1,000 500 to 700 650	Normal recording.
• Office with fluorescent lighting. • Room lit by two 30W fluorescent lights.	400 to 500 300	Video light recommended.
• Arcade at night. • Theater (theatre) lobby. • Candle light.	150 to 200 15 to 30 10 to 15	Video light required.

What is an ND Filter? It is a filter that reduces amount of light passing through without causing coloration changes.

After Recording

1. Eject a tape you have recorded. (see page 28)
2. If you want to protect accidental erasure of a tape you have recorded, push the protection tab on the cassette.
3. Set the POWER switch to OFF.
4. Close the LENS cover.
5. Remove the BATTERY PACK from the camcorder.

Playing back a Tape

- ⌘ To watch a tape you recorded.
- ⌘ Playback function works in PLAYER mode only.
- ⌘ There are two ways to watch a tape;
 - To watch with LCD : recommended for outdoor use.
 - To watch with TV monitor : recommended for indoor use.

To watch with LCD

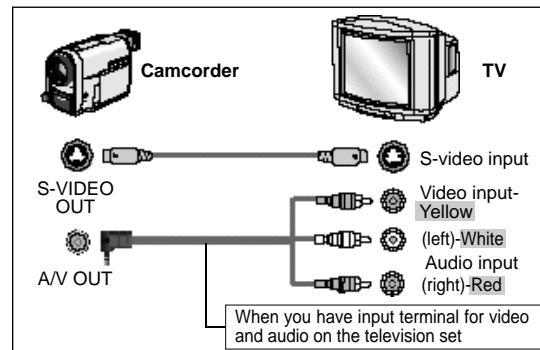
- ⌘ It is practical to view a tape using the LCD in a car or outdoors.

To watch with TV monitor

- ⌘ It is practical to view a tape using a TV monitor while indoors.
- ⌘ To play a tape back, the TV must feature a compatible color system.
- ⌘ We recommend that you use an AC Power Adaptor for the power source of the camcorder.

Connecting to a TV which has an Audio and Video input jack

- ⌘ Use the Audio/Video cable supplied with your camcorder.
 - The yellow plug : Video
 - The white plug : Audio(L)
 - The red plug : Audio(R)



Note

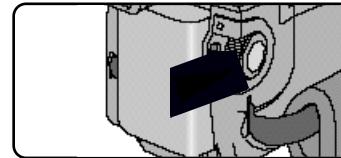
- You can use the S-VIDEO cable (supplied with accessories) to obtain better quality pictures if you have an S-VIDEO connector on your TV.
- Even if you use S-video cable, you must connect an audio cable.
- While playing back on a TV screen, close the LCD panel. Otherwise, picture distortion may occur.

Playing back a Tape

Playback

» You can play the recorded tape in PLAYER mode.

1. Use the TV/VIDEO button to select VIDEO on your TV.
 - If you are connecting the camera to a VCR, set the input selector on the VCR to LINE.
2. Connect a power source(battery or AC Power Adaptor) to the camcorder.
3. Set power switch to PLAYER.
4. Insert a tape you want to see.
5. Using ►►(FF) and ◀◀(REW) buttons, find the part of the tape you want to view.
6. Press the ►(PLAY) button.
 - The picture you recorded appears on the TV after a few seconds.
 - If the tape reaches its end during playback, the tape will rewind automatically.



Note

- It is best to decrease the volume of the built-in speaker when your camcorder is connected to the TV.

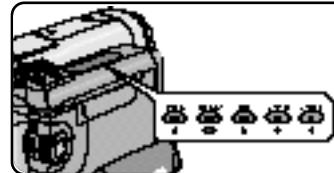
Playing back a Tape

Various Functions in PLAYER mode

The PLAY, STOP, FF, REW, STILL buttons are located on the camcorder and the Remote Control.
The SLOW and F.ADV(Frame advance) buttons are located on the Remote Control only.

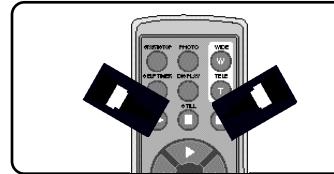
To view a STILL picture (Playback pause)

- ⌘ Press **II** (STILL) button during playback or slow playback.
 - ⌘ To resume playback, press **▶**(PLAY) or **II** (STILL) button again.
- Note** - To prevent tape and head-drum wear, your camcorder will automatically stop if it is left for more than 3 minutes in STILL mode without operation.



To locate a scene (picture search)

- ⌘ Press **▶▶** (FF) or **◀◀** (REW) button once during playback or still mode.
To resume normal playback, press **▶**(PLAY) button.
- ⌘ Keep pressing **▶▶** (FF) or **◀◀** (REW) button during playback or still mode.
To resume normal playback, press **▶**(PLAY) button.



To view a picture playing back slowly

- ⌘ Press the SLOW button on the Remote Control during playback.
- ⌘ To resume normal playback, press **▶**(PLAY) button.

To view a picture frame by frame

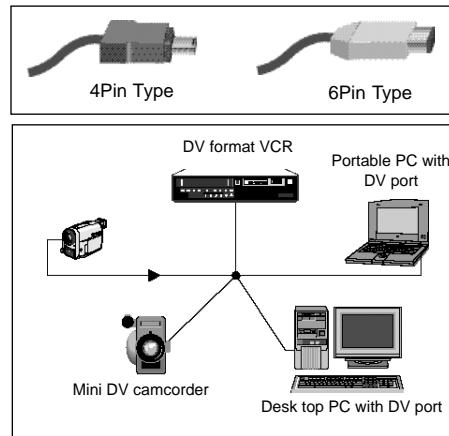
- ⌘ Press the F.ADV button on the Remote Control in still mode.
The F.ADV function works in still mode only.
- ⌘ To resume normal playback, press **▶**(PLAY) button.

IEEE 1394 Data Transfer

Transferring IEEE1394(i.LINK)-DV standard data and connection

Connection with DV device

- ⌘ Connection with other DV standard products.
 - DV standard connecting is quite simple. If a product has a DV port, you can transfer data by connecting to the port with a proper cable.
- !!! Be careful. There are two types of DV ports. (4pin, 6pin) SCD55/D60 has a 4pin terminal.
- ⌘ With digital connection, video and audio signals are transmitted in digital form for high quality image transfer.



Connecting with PC

- ⌘ If you want to transmit data to a PC, you must install an IEEE 1394 add-on card (not supplied) on the PC.
- ⌘ Depending on the capability of the PC, it can limit the frame rate recorded for video capturing.

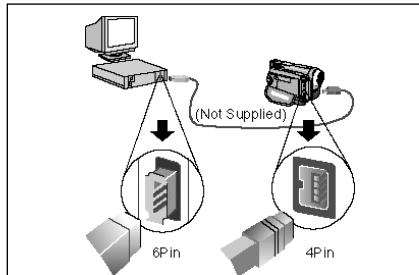
Note

- When you transmit data from this camcorder to another DV device, some functions can not work. In this case, please reconnect the DV cable or turn off and on the power again.

IEEE 1394 Data Transfer

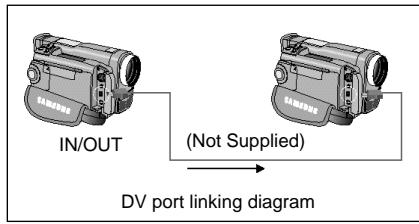
• System requirements

- CPU : faster Intel® Pentium II™ 350Mhz compatible, APPLE® Power Mac
- Operating system : Windows®98SE, ME, NT, Mac OS
- Main memory : more than 64 MB RAM
- HDD : 20 MB free hard disk space and Ultra-wide SCSI type HDD recommended
- IEEE1394 add-on card or built in IEEE1394 card



Recording with DV connecting cable

1. Set the power switch to PLAYER mode.
2. Connect the DV cable(not supplied) to DV IN/OUT port of SCD55/D60 and to DV IN/OUT port of the other DV device.
3. Make sure DV IN appears on the monitor.
DV IN may also appear on the other connected device.
(You can not see the DV IN OSD in camera mode).
4. Make sure pictures are transmitted from the other DV device.
5. Press the START/STOP button to start recording.
 - If you want to pause recording for a while, press the ■ (STILL) button.
 - To resume recording, press the ■ (STILL) button again.
6. To stop recording, press the ■ (STOP) button.



Note

- When making recordings on the camcorder, the pictures on the LCD or a TV monitor may occasionally be uneven, however recorded pictures are not affected.

RS-232C Data Transfer (SCD60 only)

Transferring RS-232C (DV-CAPTURE) data and Connection

- ⌘ The RS-232C (DV-CAPTURE) function lets you easily transfer still images to PC without other optional add-on cards.
- ⌘ If you want to transfer data to PC, you must install the software (Photoland RS) supplied with the camcorder.

System Requirements

- CPU : faster Intel® Pentium™ or AMD™ K6™ Processor
- Operating system : Windows® 95, Windows® 98, NT, 2000
- Main memory : minimum 16 MB RAM
- FDD : 3.5" Floppy disk Drive
- HDD : 10 MB free hard disk space
- Graphic card : High Color (over 65,535 colors) capable video card
- Serial port : RS-232C compatible (9pin : COM port)

Program installation

- 1.Insert the Photoland RS software diskette into FDD (3.5" Floppy Disk Drive)
- 2.Click "Run" on the Windows "Start" menu.
- 3.Execute SETUP.EXE file to begin installation.
 - When FDD is set to "A:" drive: type "A:\ setup.exe" and press Enter.
- 4.When you see the start window, click on "Next" to continue installation.
- 5.When you see the finish window, click on "Finish".
- 6.Now, you can use the Photoland RS.

RS-232C Data Transfer (SCD60 only)

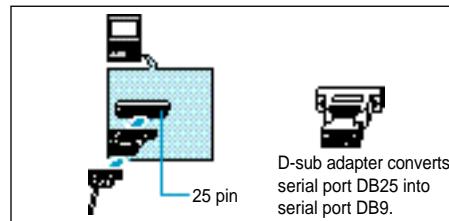
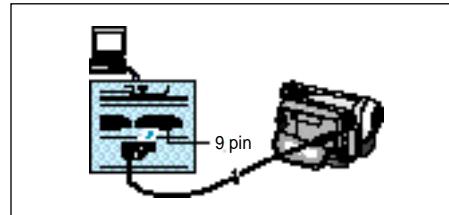
Connection with PC

⌘ Make sure that your camcorder, PC, and peripherals are switched off before you connect the RS-232C cable.

1. Connect RS-232C cable into the 9pin connector (COM port) on the back panel of your PC.

2. Connect RS-232C cable into the RS-232C terminal on the camcorder.

3. Turn on the PC, camcorder and other devices.



Note

- You can use the 25pin D-sub adaptor (Not supplied) according to your PC type and specifications.

RS-232C Data Transfer (SCD60 only)

Transferring Images to PC

- You can use the RS-232C transfer function in both CAMERA mode and PLAYER mode.
 - In CAMERA mode
You can not transfer an image during Edit search mode and recording mode or in PHOTO and GHOST mode.
 - In PLAYER mode
You can transfer a still image in PLAYBACK or STILL mode only.

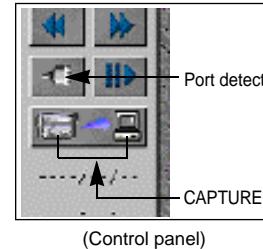
1. Connect the camcorder to the PC with the RS-232C cable.
2. Turn on the camcorder (CAMERA or PLAYER)
3. Execute the Photoland RS software.
4. Playback a recorded tape and press the ■ (STILL) button on the position of the image that you want to transfer to PC.

In CAMERA mode, choose the scene that you want to transfer to PC.

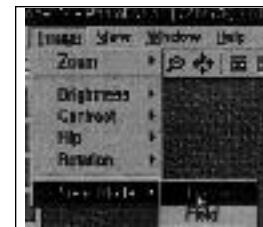
5. Press the CAPTURE icon on the control panel to start transfer.
 - The Picture will be paused and the TRANSFERRING Display will appear.
 - If you want to cancel the transfer, press the ■ (STOP) button on the camcorder or press the ESC key on the PC.
 - If you want to transfer a high resolution image in CAMERA mode, select the FRAME mode in the PHOTO MODE (see page 51), and select the Frame in the VIEW MODE (in Image menu on the menu bar) or press the Frame icon on the tool bar.
 - If you get a broken image, select the FIELD from the image menu on the menu bar or press the FIELD icon on the tool bar.
6. Save the transferred images using the Save menu in File menu on the menu bar.

Note

- When the Photoland RS cannot find the proper COM port, press the PORT (port detect) icon on control panel.
- If port is still not detected, reconnect RS-232 cable.



(Control panel)



(Menu bar)

Maintenance

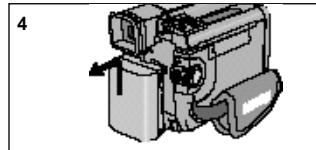
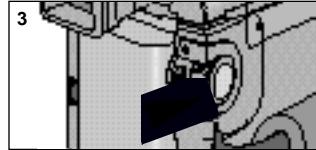
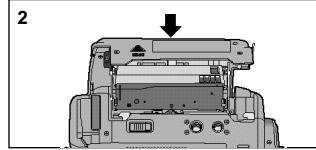
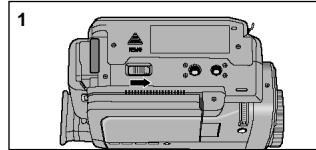
After finishing a recording

At the end of a recording you must remove the power source .

Recording with the Battery Pack and leaving the pack on the camcorder can reduce the life span of the battery.

After completing a recording

1. Slide the EJECT switch in the direction of the arrow.
 - Opening the cassette door ejects the tape automatically.
 - Wait until the tape is completely ejected safely.
2. After removing the tape, close the door first and keep the camcorder in a dust free environment.
 - Dust and other foreign materials can cause image degradation.
3. Set the power switch to 'OFF' mode.
4. Disconnect the power source or remove the Lithium Ion Battery Pack.
 - When disconnecting the power supply, remove the DC cable from the camcorder before unplugging the AC cord.



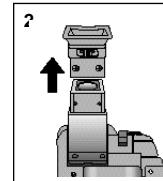
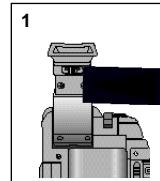
Maintenance

Cleaning and Maintaining the Camcorder

Cleaning the viewfinder

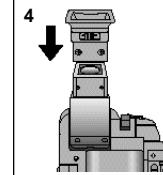
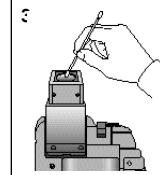
- **Releasing the Eyecup**

1. Pull the VIEWFINDER up and then turn two screws counter-clockwise.
2. Pull EYECUP out.
3. Clean the EYECUP and the VIEWFINDER screen with a soft cloth and cotton swab or a blower.



- **Reattaching the Eyecup**

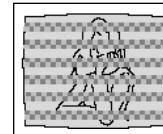
4. Put the EYECUP on the VIEWFINDER.
5. Put screws back on.



Cleaning the Video Heads

To ensure normal recording and clear pictures, clean the video heads when the playback pictures display square block-shaped picture noise or only the blue screen appears during playback, as the video heads may be dirty.

1. Set the power switch to PLAYER mode.
2. Insert the cleaning tape.
3. Press the ▶ (PLAY) button.
4. Press the ■ (STOP) button after 10 seconds.



Note

- Check the quality of the picture using a video cassette. If it is still bad, repeat the operation.
If the problem continues, contact your local authorized service center.
- Clean the video heads with a dry type cassette cleaner.

Using Your Camcorder Abroad

- ⌘ Each country or area has its own electric and TV color system.
- ⌘ Before using your camcorder abroad, check the following points.

Power sources

- You can use your camcorder in any country or area with the supplied AC Power Adaptor within 100V to 240V, 50/60 Hz.
- Use a commercially available AC plug Adaptor, if necessary, depending on the design of the local wall outlet.

Color system

- You can view your recording in the viewfinder.
However, to view it on a television or copy it to a video cassette recorder, the television or VCR must be NTSC-compatible and have the appropriate audio/video jacks.
Otherwise, you may need to use a transcoder.

- **PAL-compatible area**

Australia, Austria, Belgium, Bulgaria, China, CIS, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Great Britain, Holland, Hong Kong, Hungary, India, Iran, Iraq, Kuwait, Libya, Malaysia, Mauritius, Rumania, Saudi Arabia, Singapore, Slovak Republic, Spain, Sweden, Switzerland, Syria, Thailand, Tunisia, etc.

- **NTSC-compatible area**

Bahamas, Canada, Central America, Japan, Mexico, Philippines, Korea, Taiwan, United States of America, etc.

Note

-You can make recordings with your camcorder anywhere in the world and you can watch the playback picture with the LCD.

Troubleshooting

Troubleshooting

Before contacting a service center, perform the following simple checks.

They may save you the time and expense of an unnecessary call.

Self Diagnosis Display

Display	Blinking	Informs that...	Action
	slow	the battery pack is almost discharged.	Change to a charged one.
	fast	the battery pack is fully discharged.	Change to a charged battery.
2MIN	slow	When the remaining time of the tape is about 3 minutes.	Prepare a new one.
TAPE END	no	the tape reached its end.	Change to a new one.
TAPE	slow	there is no tape in camcorder.	Insert a tape.
TAPE	slow	the tape is protected to	If you want to record, release the protection.
C.EMG D.EMG L.EMG R.EMG	slow	the camcorder has some mechanical fault.	1. Eject the tape. 2. Set to OFF. 3. Detach the battery. 4. Reattach the battery. <small>* If repeated contact local service.</small>
DEW	slow	moisture condensation has formed in the camcorder.	see below.

Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly.

To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensor.

If there is moisture inside the camcorder, "DEW" is displayed.

If this happens, none of the functions except cassette ejection will work.

Open the cassette compartment and remove the battery.

Leave the camcorder for at least two hours in a dry warm room.

Troubleshooting

※ If these instructions do not allow you to solve the problem, contact your nearest authorized service center.

Symptom	Explanation/Solution
You cannot switch the camcorder on.	Check the battery pack or the AC Power Adaptor.
START/STOP button does not operate while recording.	Check the POWER switch, set to CAMERA. You have reached the end of the cassette. Check the record protection tab on the cassette.
The camcorder goes off automatically.	You have left the camcorder set to STBY for more than 3minutes without using it. The battery pack is fully exhausted.
The battery pack is quickly exhausted.	The atmospheric temperature is too low. The battery pack has not been fully charged. The battery pack is completely dead, and cannot be recharged, Use another battery pack.
When you see a blue screen during playback.	The video heads may be dirty. Clean the head with a cleaning tape.
A vertical strip appears on the recorded screen of dark background.	The contrast between the subject and the background is too great for the camcorder to operate normally. Make the background bright to reduce the contrast or use the I-BLC/BLC function while you are recording.
The image in the viewfinder is blurred.	The Viewfinder lens has not been adjusted. Adjust the viewfinder control lever until the indicators displayed on the viewfinder come into sharp focus.
Auto focus does not work.	Check the M.FOCUS menu. Auto focus does not work in the Manual Focus mode.
Play, FF or REW button do not work.	Check the POWER switch. Set the power switch to VCR. You have reached the beginning or end of the cassette.
When you see a broken block image during the EDIT SEARCH.	It is the characteristic of this camcorder and it is not a failure or defect.

Specifications

Model name: SCD55/D60

Broadcasting method	PAL method
Recording method	Mini DV method (consumer-use digital VCR SD format)
Tape	Digital video tape (6.35 mm width): Mini DV cassette
Tape speed	SP : approx. 18.81 mm/s
Tape recording time	SP : 60 minutes (when using DVM 60)
Power source	DC 8.4 V, Lithium Ion Battery Pack 7.4 V
Power consumption	7.7 W(LCD), 7 W(CVF) during recording
Power source type	Lithium Ion Battery Pack, Power supply (100 V~240 V) 50/60 Hz
Operating temperature	0°~40°C (32°F~104°F)
Operating humidity	10~80%
Storage temperature	-20°C ~ 60°C (-4°F ~ 140°F)
External dimension	Length 155 mm(5.47 in.), Height 90 mm(3.54 in.), Width 75 mm(2.95 in.)
Weight	650 g (1.43 lb)
DV input/output	4 pin special connector
RS-232C output	3 pin mini jack
Video output	1 Vp-p (75 terminated)
S-video output	Y : 1 Vp-p, 75 , C : 0. 286 Vp-p, 75
Audio output	-7.5 dBs (600 terminated)
FF/REW time	Approx. 160 sec. (using DVM60 tape)
Viewfinder	SCD60 : 0.44" color LCD; SCD55 : 0.24" EVF
LCD	2.5" high resolution color TFT LCD (112,320 pixels)
Lens	F1.6 22x (Optical), 440x (Digital) Electronic zoom lens
Built-in MIC	omnidirectional stereo condenser microphone
Remote control	Indoors: greater than 15 m (49ft) (straight line) Outdoors: greater than 5 m (16ft) (straight line)

- External appearance and the product standards for this product can be modified without any prior notice for the improvement of product quality.

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Warranty

SAMSUNG LIMITED WARRANTY

SAMSUNG Electronics America Inc. (SEA), warrants that this product is free from defective material and workmanship. SEA further warrants that if product fails to operate properly within the specified warranty period and the failure is due to improper workmanship or defective material, SEA will repair or replace the product at its option.

All warranty repairs must be performed by a SEA authorized service center. The name and address of the location nearest you can be obtained by calling toll free: 1-800 SAMSUNG (1-800-726-7864).

Labor

90 days carry-in

Parts

1 year

On carry-in models, transportation to and from the service center is the customer's responsibility.

The original dated sales receipt must be retained by the customer and is the only acceptable proof of purchase. It must be presented to the authorized service center.

EXCLUSIONS (WHAT IS NOT COVERED)

This warranty does not cover damage due to accident, fire, flood and/or other acts of God; misuse, incorrect line voltage, improper installation, improper or unauthorized repairs, commercial use, or damage that occurs in shipping.

Exterior and interior finish, lamps, and glass are not covered under this warranty.

Customer adjustments which are explained in the instruction manual are not covered under the terms of this warranty. This warranty will automatically be voided for any unit found with a missing or altered serial number. This warranty is valid only on products purchased in the United States and Puerto Rico.

Some States do not allow the exclusions or limitations of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

THIS CAMCORDER IS MANUFACTURED BY:



SAMSUNG Electronics America Inc.
105 Challenger Road, Ridgefield Park N.J 07660-0511
Tel: 1-800-SAMSUNG
(1-800-726-7864)

*Samsung Electronics'Internet Home Page
United States <http://www.sosimple.com>

AD68-00248H